

THLASPI TUBEROSUM NUTT., A TAXONOMIC
SYNONYM OF CARDAMINE DOUGLASSII BRITT.
(CRUCIFERAE)¹

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When Thomas Nuttall undertook his journey of scientific exploration into the "Old Northwest" (the Great Lakes Region) in the year 1810, he discovered several new species of plants, twenty of which he described as new in his now classic book, *The Genera of North American Plants, and a Catalogue of the Species, to the Year 1817*, published in 1818. In the course of preparing an account of Nuttall's plant collections of this trip, I learned that his *Thlaspi tuberosum*, described from western Pennsylvania, has not been adequately understood by plant taxonomists. It would be an easy matter to make the proper determination of the plant and state the taxonomic position of this species if Nuttall's original specimen were available for study today. As pointed out by Ewan (1952) a mystery surrounds the whereabouts and existence of certain of Nuttall's plants believed to have been obtained on this trip. My own study of Nuttall's writings and his plant specimens in the herbarium of the Academy of Natural Sciences of Philadelphia gives evidence that Nuttall may have lost many of his plants of this trip and then replaced some of these with plants obtained later on the same trip, or on another trip, or from another botanist (Stuckey, 1967). The specimen of *Thlaspi tuberosum* evidently was one of those which was not replaced. No specimen labeled as *T. tuberosum* has been located in the herbaria of the British Museum (London), the Royal Botanical Gardens (Kew), the City of Liverpool Museums, or the Academy of Natural Sciences, all of which have Nuttall's plants collected previous to the publication of his *Genera*.

Nuttall's description of *T. tuberosum* in the *Genera* is quite brief and, as is shown below, even inaccurate at one

¹Paper No. 731 from the Department of Botany, The Ohio State University, Columbus 43210.

point; consequently later writers have not been able to determine properly to what plant the description refers. DeCandolle (Syst. Nat. 2: 382. 1821 and Prodr. 1: 177. 1824) included *T. tuberosum* as a valid species, but placed it in a category of *Species non satis notae* because he did not have sufficient information to determine its relationship to other species. Eaton (Man. 3rd. ed. 486. 1822) wrote a description of *T. tuberosum* nearly identical to that given by Nuttall, and he continued this species and its description in all the succeeding editions of his *Manual*. Torrey and Gray (Fl. N. Am. 1: 114. 1838) also included *T. tuberosum*, but Gray did not mention or give a description of it in the first edition of his *Manual* (Gray, 1848), nor in the following four editions. Neither did Britton and Brown (1897, 1913) discuss this species. Payson (1926), who revised the genus *Thlaspi* for North America, stated that the genus was entirely lacking in northeastern America, and therefore he made no mention of Nuttall's *T. tuberosum*. Recent floristic works of northeastern North America, such as Fernald (1950), Gleason (1952), and Gleason and Cronquist (1963) also do not record this species. It therefore appears that the proper status of *T. tuberosum* has been lost sight of through the years and has never adequately been determined.

In a situation where the original specimen is apparently not extant, it is often necessary to turn to other sources of supplementary data, if they are available, in order to gain a clearer understanding of the original description. These data may be found among the author's field notes, diaries, or letters. It is fortunate that Nuttall's diary of the early portion of his 1810 trip was discovered and subsequently published by Graustein (1951). In this diary Nuttall wrote descriptions of plants he saw and studied. Whether he referred to these descriptions when he wrote the diagnoses in his *Genera* is not known. Detailed comparisons of these accounts in these two works might be made to determine their similarities and differences which in turn might lead to a clearer understanding of certain species' diagnoses in

Nuttall's *Genera*. Upon making several comparisons, I discovered that Nuttall's diagnosis of *T. tuberosum* in the *Genera* appears to be a condensed version of a much more detailed account of a plant he observed near Butler, about 27 miles north of Pittsburgh, and subsequently described in his diary (Graustein, 1951, p. 29). Pertinent data from these two sources are compared in the following chart.

	GENERA	DIARY
Name:	" <i>Thlaspi tuberosum</i> "	"a species of Cardamine?"
Root:	"tuberous and fibrous"	"an irregular tho' some what roundish tuber, (or rather bulb,) having several knobs or protuberances on its under surface"
Stem:	"pubescent; very short and simple"	"roundish"
Leaves:	"rhomboid-ovate, obsoletely toothed, smooth, and sessile, radical ones upon long petioles"	"radical leaves are from reniform-cordate to obcordate, mostly entire tho' sometimes slightly dentate stem leaves, subcordate-lanceolate, obtuse, distantly & bluntly toothed, the uppermost leaves sessile & somewhat cuneate"
Flowers: (petals)	"rather large, like those of an <i>Arabis</i> , rosaceous"	"rather large, . . . of a pale purplish tinge"
Fruit:	"Silicle suborbiculate, short and compressed"	"Silique, erect, compressed. obcordate"
Height:	"Not more than 4 or 5 inches"	"about ½ foot high"
Flowering:	"April and May"	seen 26 April 1810
Habitat:	Data not given	"in moist shady woods generally nr. rivulets in a rich vegetable earth"
Locality:	"Western Pennsylvania"	Near Butler, about 27 miles north of Pittsburgh

Although the data from these two sources do not completely agree, there is little question that the two descriptions refer to the same species. The notes on habitat, flowering time, and the diagnosis of the plant's morphology, except the description of the fruit, all point to its being

Cardamine douglassii Britt. Greene (1896), Schulz (1903), and Stuckey (1962), who have previously treated the taxonomy and nomenclature of *Cardamine douglassii* or its synonyms, do not mention *T. tuberosum*, although Watson (A. Gray, Syn. Fl. N. Am. 1(1): 156. 1895) had suggested that Nuttall's *T. tuberosum* was probably the same as *C. douglassii* (*C. rhomboidea* (Pers.) DC. var. *purpurea* Torrey) because of its tuberous root, rose-colored flowers, and pubescence. Watson also stated that Nuttall described the pod "as orbicular." The fruit of *C. douglassii* is long and somewhat tapered at the apex. To my knowledge there is no member of the Cruciferae of eastern North America which has an obcordate or suborbicular fruit with the vegetative and flower characters of *C. douglassii*. This discrepancy in the original diagnosis has doubtless been the major reason why botanists have not been able to properly classify Nuttall's species. Graustein (1951, p. 29, footnote 60) regarded Nuttall's description to be in error with respect to fruit shape. Was this an error Nuttall made when looking at the plant? Or did Nuttall, in writing his notes, confuse this species with some other species? Examination of the *Genera* reveals that Nuttall did not give any description or mention any species under *Cardamine* or *Arabis* that would include the present-day understood *C. douglassii*. By comparing the data in the *Genera* with the information in the diary, it is clear that Nuttall's note pertaining to *Thlaspi arvense* is the same species as the *T. arvense* of today. His reference to *T. alliaceum* is the *Lepidium campestre*, and his *T. bursa pastoris* is the *Capsella bursa-pastoris*. Thus, other possible species of *Thlaspi* or species in allied genera which might be considered to agree with Nuttall's description of *T. tuberosum* (at least with respect to the fruit shape he gave) were otherwise included in his *Genera*.

On the basis of publication date only, Nuttall's *Thlaspi tuberosum* (Gen. 2: 64. 1818) has priority over Britton's *Cardamine douglassii* (Trans. N. Y. Acad. Sci. 9: 8. 1889). If *T. tuberosum* were transferred to *Cardamine*, it would create a later homonym because there already exists a

Cardamine tuberosa described by DeCandolle (Syst. Nat. 2: 254. 1821) from Chile and illustrated by Delessert (Ic. Sel. Pl. 2: t. 29. 1823). A study of DeCandolle's diagnosis of *C. tuberosa*, the photograph of the type specimen on a microfiche card of the DeCandolle herbarium (Card No. 69), the drawing in Delessert, and the illustration in Schulz (1903, t. 10, f. 1) reveals that plants of *C. tuberosa* DC. are very similar to plants of *C. douglassii* Britt. with respect to size, tuberous base, basal leaves, pedicel position, and flower morphology. However, the cauline leaves are trifoliate in the former and simple in the latter. Schulz (1903) separated *C. douglassii* Britt. (*C. rhomboidea* (Pers.) DC.) from *C. tuberosa* DC. primarily on the basis of the difference in morphology of the cauline leaves. In addition, Schulz pointed out that the petals of *C. tuberosa* DC. are white. I conclude that *C. tuberosa* DC. and *C. douglassii* Britt. are indeed two different species based on different types, and therefore *T. tuberosum* Nutt. is properly placed in synonymy under *C. douglassii* Britt.

My thanks are extended to Dr. Alfred E. Schuyler (The Academy of Natural Sciences) who searched for Nuttall's specimen of *T. tuberosum* at the British Museum, to Dr. Edward G. Voss (The University of Michigan) who has read the manuscript, and to Sir George Taylor (Royal Botanical Gardens, Kew) and Dr. E. F. Greenwood (City of Liverpool Museums) who have answered my letters of inquiry regarding the possibility of Nuttall's specimen of *T. tuberosum* being in their herbaria.

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